

would involve comparisons and discussions that would extend far beyond the limits of an article in the 'Entomologist.'

I may mention that the larva was found in the purest and driest of fine sea-sand. It was brought home in a tin containing some of the sand; this was wetted and so made more solid, and the larva evidently appreciated this, and burrowed in the wet sand. I did not keep it long alive, as I feared it might change to a pupa. I have no doubt that it is carnivorous and predaceous.

Brockenhurst: May 28th, 1912.

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## NOTES ON THE BRITISH MOSQUITOS (CULICINÆ).

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CONSIDERING the great interest now taken in the blood-sucking gnats or "mosquitos," their economic importance in relation to disease, the large number of workers engaged in their study, and the enormous output of literature concerning them, it is somewhat remarkable that so little has been written about the British species. Indeed, the only attempt at a general systematic account of them (apart from the treatment in Walker's 'Insecta Britannica, Diptera' [1856]), so far as I am aware, is that of Stevens, published in 1825. Needless to say, these are hopelessly out of date, and the descriptions are so meagre that it is impossible to recognize to what insects they are intended to apply. Thus their determination is a matter of needless difficulty. It is true that good descriptions of most of the species are to be found in Theobald's 'Monograph of the Culicidæ of the World,' but these have to be picked out of an enormous mass of material, while the keys to the genera and species which the author gives are in many cases difficult of application and not of much value; to say nothing of the fact that his system of classification is not accepted by other entomologists who have studied these insects, and by dipterists in general. This being the state of affairs, it seems as though it would be of use to give a concise synopsis of the British species, taking into account the most recent researches. It is hoped that the following tables and notes will be found workable and helpful, and that they may be the means of inducing some to take up the study of these interesting insects during the present summer. There is much work yet to be done before our knowledge of them approaches completeness: the larvæ of several species are yet undiscovered, and it is probable that even the number of species on the British list is not yet complete. One species is introduced in the present

paper as new to our fauna, and others are very likely to occur if searched for.

The writer merely hopes in these notes to pave the way for further and more detailed work by enabling the collector to name his material correctly. With this end in view, tables for determining the adults are given, with brief descriptions of each species. The common gnat is so well known that no general description is necessary—all Diptera with a long proboscis and the same type of wing-venation as is found in *Culex pipiens* may be assumed to be "mosquitos." This term is rightly applicable to any member of the group, and should not be limited to a particular species or genus.

The following artificial key may serve as a rough guide in the identification of a specimen, but its proper generic position should, of course, be ascertained by the aid of the tables :—

- A. Tarsi ringed with white at the bases of the joints.  
 a. Metatarsi without a median pale ring.  
*O. cantans*, *O. annulipes*, *O. vexans*.  
 b. Metatarsi with a median pale ring.  
*Th. annulata*, *Tæn. richiardii*.
- B. Tarsi pale-ringed, the rings embracing both ends of the joints.  
 a. Abdomen with a median longitudinal pale stripe, more or less interrupted.  
*O. dorsalis*.  
 b. Abdomen without such stripe, but with whitish bands at the bases of the segments.  
*Th. morsitans*, *Th. theobaldi*.
- C. Tarsi entirely dark.  
 a. Abdomen not scaly. *Anopheles*.  
 b. Abdomen scaly.  
 i. Segments of abdomen with complete basal pale bands.  
*O. diversus*, *O. nemorosus*, *O. salinus*, *C. pipiens*.  
 ii. No complete pale bands on abdomen.  
*O. lateralis*, *A. cinereus*.

#### TABLE OF GENERA.

Males (antennæ plumose):

- |   |                |
|---|----------------|
| 1. Scutellum rounded; legs very slender; abdomen without scales . . . . .   | 1. ANOPHELES.  |
| Scutellum more or less trilobed; abdomen scaly (the scales are, of course, easily rubbed off, but will be quite evident except in very bad specimens) . . . . . | 2.             |
| 2. Palpi very short . . . . .   | 3. AÆDES.      |
| Palpi long, rarely shorter than the proboscis . . . . .   | 3.             |
| 3. Last two joints of palpi more or less swollen, and never curved upwards . . . . .  | 4.             |
| Last two joints of palpi quite thin, curved upwards . . . . .   | 6. CULEX.      |
| 4. Last joint of palpi distinctly thicker than the penultimate . . . . .  | 5. THEOBALDIA. |

Last joint of palpi never thicker than penultimate, usually distinctly thinner . . . . . 5.

5. The smaller claw on the fore and mid feet simple (metatarsi with pale rings in the middle) 4. TÆNIORHYNCHUS.  
The smaller claw on the fore and mid feet toothed (metatarsi not pale-ringed in the middle) 2. OCHLEROTATUS.

Females :

1. Palpi as long as proboscis . . . . . 1. ANOPHELES.  
Palpi much shorter than proboscis . . . . . 2.  
2. Claws toothed (rarely the hind pairs are simple); abdomen pointed; ovipositor externally prominent . . . . . 3.  
Claws all simple; abdomen usually blunt-ended; ovipositor hardly visible externally . . . . . 4.  
3. Head almost covered with broad flat scales . . . 3. AÆDES.  
Middle of head (above) with only quite narrow scales . . . . . 2. OCHLEROTATUS.  
4. Hind metatarsus shorter than the tibia . . . . . 5.  
Hind metatarsus as long as the tibia . . . . . 6. CULEX.  
5. Cross-veins separated by less than the length of the posterior; lateral vein-scales narrow . . . 5. THEOBALDIA.  
Cross-veins separated by more than the length of the posterior; lateral vein-scales mostly rather broad . . . . . 4. TÆNIORHYNCHUS.

#### Genus I. ANOPHELES.

The species of this genus are readily recognized by the long female palpi, and by a number of minor characters, such as the absence of scales on the body.

We have only three species of *Anopheles* in Britain. Theobald, indeed, states that he has taken a fourth—the North American *A. barberi*—in England, but this requires confirmation. The larva of *A. barberi* is distinguished from those of other *Anopheles* by “the slight development of the head hairs, the presence of plumose hairs after the third abdominal segment, and the absence of short teeth on the comb of the eighth segment.”

1. *A. maculipennis*, Mg.; the Spotted Gnat.—Distinguished from the other two species by the presence of spots on the wings, formed by the accumulation of scales. Grey-brown to grey-ochreous in colour. Average length (without proboscis), 6 mm.

Widely distributed in the south and east of England, and common in marshy places; occurs also in North Wales.

2. *A. bifurcatus*, L.—Closely resembles *A. maculipennis* in size and colour, but differs most obviously in the entire absence of the dark spots on the wings. It seems to be less common than the preceding, but has a similar distribution.

3. *A. plumbeus*, Stephens.—Smaller and darker than the two preceding; the wings are somewhat narrower, the scales

being blacker and rather denser; the thorax (in good specimens) is ashy-grey in the middle, blackish at the sides, and bears anteriorly some white hair-like scales, the vestiture of the thorax in the other two species being yellowish; the abdomen is black, not brown or greyish-brown. Average length, 4.5 mm.

This species seems to have a wider distribution than the other two, as it has been recorded from Scotland and Ireland. As Theobald remarks: "There is little doubt that Haliday's [Stephens's] *A. plumbeus*, taken in the North of Ireland in July, is this species [*A. nigripes*, Staeger]." It is best known under this latter name.

#### GENUS 2. OCHLEROTATUS.

This genus includes most of the European species till recently placed in *Culex*. It is, however, at least as distinct from *Culex* as *Aedes* is. The eggs are deposited singly (as in *Aedes*), not in masses (as in *Culex*).

The writer has been able to recognize eight species in Britain, which can be distinguished as follows:—

- |   |                       |
|---|-----------------------|
| 1. Tarsi (especially those of the hind legs) pale-ringed . . . . .  | 2.                    |
| Tarsi entirely dark . . . . .   | 5.                    |
| 2. Pale rings of tarsi embracing both ends of the joints,<br>on hind legs the whole of the last joint is pale . . . . .                                   | 1. <i>dorsalis</i> .  |
| Pale rings of tarsi at bases of joints only . . . . .   | 3.                    |
| 3. Pale rings of hind tarsi very narrow; wing-scales all<br>dark . . . . .  | 2. <i>vezans</i> .    |
| Pale rings of hind tarsi broad, except on first and last<br>joints; wings with both dark and light scales . . . . .                                       | 4.                    |
| 4. Yellower species; a broad band of yellowish scales<br>on each side of the mesonotum . . . . .  | 3. <i>annulipes</i> . |
| Brownier species; mesonotum mostly brown-scaled,<br>with lateral spots or lines of whitish scales . . . . .   | 4. <i>maculatus</i> . |
| 5. Segments of abdomen with basal pale bands; mar-<br>gins of thorax not whitish . . . . .  | 6.                    |
| Segments of abdomen with lateral basal white spots;<br>margins of mesonotum broadly white-scaled . . . . .  | 8. <i>lateralis</i> . |
| 6. Wings speckled with light and dark scales, on nearly<br>all the veins . . . . .  | 5. <i>salinus</i> .   |
| Wings with few or no light scales . . . . .   | 7.                    |
| 7. Pale bands of abdomen yellow, tending to spread out<br>in the middle, and sometimes forming a median<br>yellow line on the last few segments . . . . . | 6. <i>diversus</i> .  |
| Pale bands of abdomen whitish, tending to spread<br>out laterally, and sometimes almost divided into<br>pairs of triangular spots . . . . .               | 7. <i>nemorosus</i> . |

1. *O. dorsalis*, Mg.—Scales of head bright reddish-brown at the sides, whitish in the middle. Thorax mainly clothed with bright reddish-brown scales, but with two rather broad whitish longitudinal stripes. Wings and legs speckled with dark and

light scales, as in *O. maculatus* and *O. nemorosus*. Abdomen with yellowish bands, each embracing two contiguous segments, and connected by a median dorsal yellowish line, so that in pale specimens each segment of the abdomen appears to have a pair of subquadrate dark brown patches. Average length, ♂ 6·5 mm., ♀ 5 mm.

This species occurs abundantly at Aldborough, Suffolk, and has been taken at various places in the London district (Charlton, Dartford, Albert Docks, Lewisham, Camberwell, Chiswick, Stamford Hill), and at Rochester and Wyre Forest.

I believe that Rondani's *Culex pulchripalpis* and *C. penicillaris* are both synonyms. Theobald introduced *C. pulchripalpis* as British on the strength of some specimens of this species taken at the Albert Docks.

2. *O. vexans*, Mg.—Thorax dark brown, uniformly clothed with dark golden-brown scales. Pale bands of abdomen (in female at least) narrowly interrupted at the sides and indented in the middle, so that they appear bilobed. Male genitalia very peculiar, the claspers being forked. Average length, ♂ 6 mm., ♀ 5 mm.

This species has at present but slender claims to a place in the British list. It has been confused with *Theobaldia morsitans*, and probably some of the old records of *O. vexans* really refer to that species. In the old Clifton collection in the British Museum were seven specimens of this species, all without locality label—three females unnamed, and two males, two females labelled “? *calopus*, Meig.” Apart from these the only British specimens I have seen or heard of are a male and female in the Cambridge Museum, taken at Mildenhall, Suffolk, July, 1894, by Mr. C. G. Lamb. Both these are very much rubbed, and the characteristic abdominal markings of the female removed.

*O. vexans* occurs, I believe, in North America under the name of *sylvestris*, Theo.—variously placed in *Culex*, *Ecculex*, or *Aedes*. Theobald's type was said to have the hind claws of the female simple, but most American specimens have them toothed, like the European *O. vexans*.

(To be continued.)

## DESCRIPTION OF A NEW SPECIES OF ANOMALON (ICHNEUMONIDÆ) FROM HONGKONG.

By P. CAMERON.

*Anomalon pyretorum*, sp. n.

Ferruginous, the abdomen brighter in tint; the front broadly, the vertex less broadly, occiput, the greater part of mesonotum, the lower part of the pro- and mesopleuræ, the metathorax, and more than